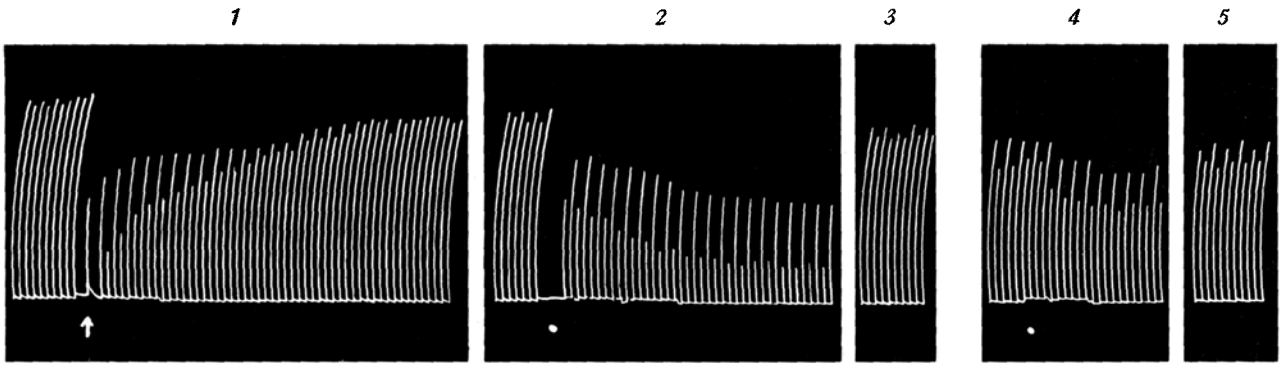


Katze, 3,5 kg; Narkose: 70 mg/kg Chloralose (intravenös, ohne Ätherein leitung); alternierende direkte und indirekte Reizung des Musculus gastrocnemius mit supramaximalen Stromstößen im Abstand von je 8 s; die Injektionen erfolgen in die Arteria ilica der Gegenseite unter gleichzeitiger Abklemmung der Aorta.

Bei *1:* 50 μg Adipinbischolin; während der Injektion ist die Reizung für 30 s abgeschaltet; der Pfeil weist auf die der Injektion folgende Zuckung; die höheren Ausschläge entsprechen der direkten Reizung.

Bei *2:* 3 mg Nikotinum tartaricum; die höheren Ausschläge sind die nach direkter Reizung.

Bei *3:* 25 min nach der Nikotininjektion ist die anfängliche Kontraktionshöhe wieder erreicht.

Bei *4:* 3 mg Nikotinum tartaricum 25 min nach 250 μg *d*-Tubokurarin injiziert; zu diesem Zeitpunkt war die Wirkung des *d*-Tubokurarins auf die indirekte Erregbarkeit bereits abgeklungen.

Der Kurvenabschnitt *5* ist 12 min nach der letzten Nikotininjektion registriert.

wenn Nikotin während des Bestehens einer Kurarelähmung injiziert wird, senkt es auch in Dosen, die ein Vielfaches der an sich muskellähmenden betragen, die direkte Erregbarkeit nicht; injiziert man es nach Abklingen der Kurarelähmung, so tritt seine Wirkung sowohl in bezug auf die direkte als auch auf die indirekte Erregbarkeit in deutlich vermindertem Ausmaß in Erscheinung (Abbildung). Dieselben Verhältnisse lassen sich in entsprechend niedrigerer Dosierung bei naher arterieller Injektion am Musculus tibialis anterior der Katze nachweisen.

Aus diesen Versuchen geht hervor, daß die muskellähmende Wirkung von jenen aliphatischen bisquarternären Ammoniumverbindungen, die am Vogelmuskel eine Kontraktur auslösen, dieselben Wirkungscharakteristika zeigt wie Nikotin; somit ist auch für die lähmenden Wirkungen dieser Substanzen – und das gleiche gilt auch noch für die muskellähmende Wirkung von Azetylcholin[1] – die Bezeichnung nikotinartig zutreffend.

K. H. GINZEL, H. KLUPP und G. WERNER

Pharmakologisches Institut der Universität Wien, den 15. Juli 1951.

Summary

Aliphatic bisquarternary ammonium compounds have the same muscle-stimulating properties as nicotine. It is also shown that the muscle-paralysing action of nicotine and of these compounds have the same characteristics: they reduce the direct excitability of the muscle and their paralysing activity is reduced by pretreatment with *d*-Tubocurarine.

[1] K. H. GINZEL, H. KLUPP und G. WERNER, Arch. exp. Path. Pharm. *213*, 453 (1951).

Absence of Growth-promoting Action of Human Saliva for Normal "Plateau" Hamsters

It has been demonstrated in growing hamsters that human saliva possesses a growth-promoting factor which is relatively heat resistant and does not exhibit sex specificity[1]. On the other hand, an aqueous extract of cow's salivary glands did not exhibit any effect which could be attributed to a specific growth-stimulating substance present in such an extract[2]. The following reports a study of the possible growth-promoting action of saliva for "plateau" hamsters, i. e., animals that had reached a weight at which normal growth is almost arrested.

Composition of the purified diet given to both groups[3]	
Ingredients	Percentage
Choline chloride . .	0·2
Vitamin mixture[4] .	0·5
Salt mixture[5] . . .	4·0
Casein[6]	22·0
Sucrose	66·3
Lard	7·0

[1] H. GRANADOS, J. GLAVIND, and H. DAM, Acta pathol. et microbiol. Scand. *27*, 65 and 501 (1950). – H. GRANADOS, Acta physiol. Scand. *24*, Suppl. 87, 69 (1951).

[2] H. GRANADOS, J. GLAVIND, and H. DAM, Acta pathol. et microbiol. Scand., in press.

[3] Each animal received weekly 1160 I. U. of vitamin A (natural ester from Distillation Products Industries, Rochester, N. Y., U.S.A.) and 17 A.O.A.C. Chick Units of vitamin D_3 ("Delsterol" from Ferrosan A/S, Copenhagen) in 3 drops of peanut oil. We thank the companies for their kind supply of these substances.

[4] The 0·5 g of vitamin mixture contained: biotin 50 μg, folic acid 50 μg, thiamine hydrochloride 5 mg, riboflavin 5 mg, pyridoxine hydrochloride 5 mg, calcium pantothenate 5 mg, nicotinic acid 8 mg, *p*-aminobenzoic acid 35 mg, inositol 15 mg, ascorbic acid 5 mg, vitamin K substitute 1 mg, *d,l*-α-tocopherol acetate 5 mg, and sucrose 410·9 mg.

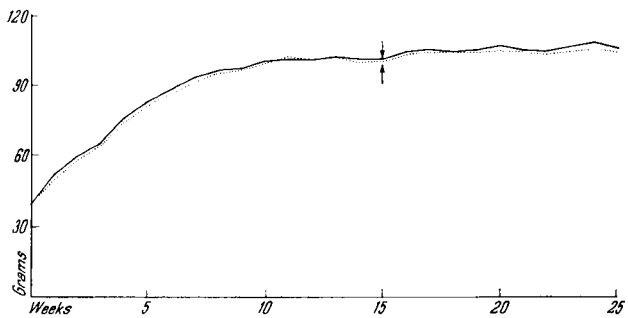
We thank F. Hoffmann-La Roche & Co., Basle, Switzerland, for their kind supply of the vitamins E (Ephynal) and K (Synkavit) used in these experiments.

[5] The salt mixture used is McCollum's Salt Mixture 185 supplemented with 13·5 mg KI, 139 mg $CuSO_4\,5H_2O$, and 556 mg $MnSO_4\,4H_2O$ per 100 g.

[6] The casein used is Vitamin-Test Casein GBI, from General Biochemicals, Inc., Chagrin Falls, Ohio, U.S.A.

Sixteen female hamsters between 22 and 26 days of age were litter-mate distributed into two equal groups, both having the same initial weight, and were reared during the first part of the experiment for 15 weeks on the purified diet presented in the Table. During this period both groups received to drink tap water *ad libitum*. From the 15th week, i. e., after both groups had exhibited consistently for four weeks a growth "plateau", group 1 received to drink daily 100 cm³ of distilled water, and group 2 100 cm³ of a raw saliva-distilled water mixture[1]. During this second part of the experiment, which was carried on for 10 weeks, both groups continued receiving the ration presented in the Table.

Both groups were weighed weekly. These studies were carried out between November 1950 and March 1951.



Average growth curves of the two groups: group 1 received distilled water throughout the whole experiment, and group 2 received distilled water during the first 15 weeks and a raw saliva-distilled water mixture during the following 10 weeks.

Group 1 ——— Group 2 .....

The figure presents the average growth curves of the two groups, during both the first and second parts of the studies. During the first part of the experiment (preliminary period, from the 1st to the 15th week) both groups grew at the same rate. The same occurred during the second part of the experiment (test period, from 15 to 25 weeks of age). Therefore it is concluded that, under the conditions of these studies, human saliva does not promote the growth of hamsters that have already attained most of their normal growth.

The present results may be interpreted in various ways: it might be that in "plateau" hamsters the growth factor of saliva does not exert any action at all, or that the amount of the active principle contained in the saliva given was insufficient to promote the growth of the animals. In this connection one could mention that, for example, the growth hormone of the hypophysis (somatotrophin) increases very markedly the growth (gigantism) of normal "plateau" rats when given in daily doses of 0·40 mg to 2·0 mg[2]. It might be of interest to repeat the present experiment when the growth factor of saliva has been concentrated, or isolated in pure or nearly pure form.

HUMBERTO GRANADOS[3] and HENRIK DAM

Department of Biology, Polytechnic Institute, Copenhagen, June 21, 1951.

[1] The saliva-water mixture contained 67% saliva and 33% water. The saliva used was a mixture of male and female saliva (50% of each) collected without stimulation every day from 8 healthy subjects between 19 and 32 years of age. The female subjects did not donate their saliva during the days they were menstruating.

[2] H. SELYE, *Textbook of Endocrinology* (Acta Endocrinologica, Université de Montréal, Montréal, Canada, 1947), p. 239.

[3] Present address: Physiological Institute, University of Basle, Switzerland.

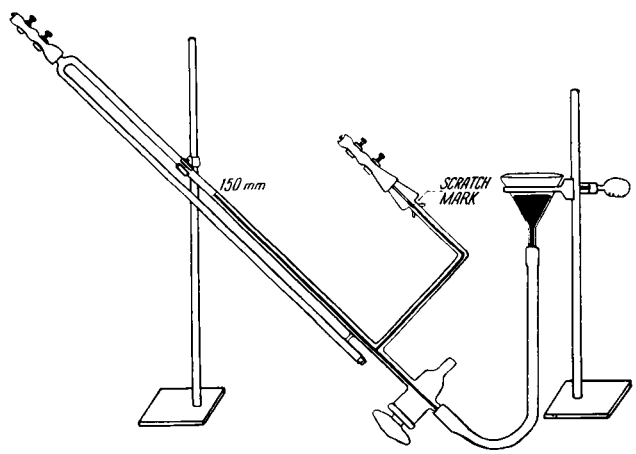
Zusammenfassung

Menschlicher Speichel wurde mit Wasser gemischt (67% Speichel + 33% Wasser) und Hamstern als Trinkflüssigkeit gegeben. Die Versuchstiere hatten ungefähr das Normalgewicht ausgewachsener Individuen. Ihr Wachstum wurde nicht angeregt. Dies steht im Gegensatz zu der früher festgestellten Wirkung von menschlichem Speichel auf wachsende Hamster.

PRO LABORATORIO

Modified Method for Calibration of Warburg Manometers[1]

In the calibration of Warburg manometers with mercury the following modification of the procedure for filling the manometer, described by LOOMIS[2] has been found to be both accurate and rapid.



Warburg Manometer calibration assembly.

As indicated in the figure, the manometer is clamped in a fixed inverted position on a ring stand and connected by rubber tubing to a mercury reservoir. The open end of the manometer is plugged with a small rubber stopper. A two and a half inch section of rubber tubing of suitable diameter is fitted over each of the remaining openings. Mercury is allowed to flow into the manometer through the stopcock. The angle of inclination of the manometer and the height of the mercury reservoir are adjusted so that the mercury rises a few millimeters above the calibration lines. With the stopcock open, the ends of the two rubber sections are closed with pinch clamps (or screw clamps as illustrated) and the mercury columns in each arm of the manometer are forced down to the calibration lines by applying pressure to the rubber sections with screw clamps. The stopcock is then closed, the rubber attachments removed, and the mercury poured into tared beakers and weighed. This procedure has been found to allow a rapid and precise adjustment of the mercury levels.

JESSE W. TIEMAN and JAY V. BECK

Pennsylvania Agricultural Experiment Station, State College, Pa., April 10, 1951.

[1] Authorized for publication on March 15 1951, as paper No. 1662 in the journal series of the Pennsylvania Agricultural Experiment Station.

[2] W. F. LOOMIS, Science *109*, 491 (1949).